

- 8 -

B13
input data blocks of the continuous digital data stream with each one of the N logical buffers so as to replicate the input data blocks thereacross, each logical buffer being associated with only one of the output ports; and

scheduling means for forwarding data blocks associated with a given logical buffer through its corresponding output port when the given logical buffer is full.

REMARKS

The Examiner has objected to each of Claims 1, 2, 4-6, 8, 10, 11, 13, 14, 16-18 and 20 under 35 U.S.C. 102(b) as being anticipated by U.S. patent No. 5,875,177 in the names of Uriu et al. (the "Uriu reference"). The Examiner contends that this reference teaches the generation of a reference pattern defining digital traffic and the generation of a plurality of traffic streams from the reference pattern, whereby the plural traffic streams are used for loading respective input ports of the communications device. Applicant respectfully traverses the Examiner's rejection in this regard, based on the claims as now amended.

Applicant submits that the Uriu reference discloses a path test system for an ATM switch having a test cell generation section for placing header information and payload information into each test cell (Column 2, lines 30 to 35; Column 3, lines 40 to 47). The output of the test cell generating section according to the Uriu reference is forwarded to an incoming transmission line of an ATM switch (Column 3, lines 47 to 50; Figure 2). There is therefore no teaching or suggestion of any kind in the Uriu reference of the generation of a plurality of traffic streams which are replicated from a reference digital traffic pattern, as now recited in Claim 1 as amended. Moreover, there is no teaching or suggestion of any kind in the Uriu reference of the

- 9 -

introduction of a phase delay in respect of the replicated traffic streams when compared to the referenced digital traffic pattern. The latter feature is now a recited element of Claim 1 as amended. Both of the foregoing features, none of which are taught or suggested by the Uriu reference, also are found reflected in each of amended independent Claims 6, 8, 13, 18 and 20. For the foregoing reasons, the Examiner is respectfully invited to withdraw her objection under 35 U.S.C. 102(b).

The Examiner next rejected each of Claims 3, 5, 7, 9, 12, 15, 17, 19 and 21 under 35 U.S.C. 103(a) in view of the same Uriu reference. For the same reasons as outlined above, and given the amendments which have now been brought to each of the independent claims from which these rejected claims depend, it is submitted that the Examiner's rejections in this regard have likewise been traversed. Namely, there is no teaching or suggestion of any kind in the Uriu reference that would lead the notional skilled person to generate a plurality of traffic streams by replication of a reference digital traffic pattern or from a single digital traffic stream and to thereafter load or provide multiple ports of a communication device with such replicated traffic.

Moreover, the Uriu reference likewise does not teach or suggest the introduction of one or more phase delays among the replicated plurality of traffic streams when same are compared to the reference digital traffic pattern or traffic stream. In fact, the notional skilled person would understand that an apparatus constructed according to the principles of the present application is not a substitute for the path test system according to the Uriu reference nor is such an apparatus in any way analogous to the path test system of Uriu. Rather, it is fully conceivable that a device according to the present invention would use a test cell stream as generated by the teachings of Uriu reference as its reference digital traffic pattern or input digital data stream. In other words, a device constructed according to the teachings of the present application would typically be

21128375.1

- 10 -

deployed between the sending trunk 8 and ATM switch 13 as depicted in Figure 2 of the Uriu reference. Thus, there would be no motivation for the person skilled in this art to arrive at the present invention by way of the teachings of the Uriu reference. The Examiner is therefore requested to withdraw her rejection of the claims under 35 U.S.C. 103(a) in view of the Uriu reference.

Claims 1, 13, 18, 20 and 22 were additionally amended to remove the phrase "to mimic real digital traffic input conditions for the communication device". The latter element is not thought to be essential to claiming the invention in question.

The Examiner lastly rejected each of Claims 22-46 under 35 U.S.C. 103(a) in view of U.S. patent No. 6,134,219 in the name of Sato (the "Sato reference").

As correctly pointed out by the Examiner, the Sato reference does not teach a broadcasting means. Nor does the Sato reference teach or suggest any other means, device or methodology for the replication of digital data streams from an input digital data stream. While an input buffer server 2 is taught by the Sato reference (Column 4, lines 7 to 12) the function of the input buffer server 2 is merely to receive and distinguish normal cells from test cells and to transfer same to an input buffer 3. No replication of an input digital data stream takes place or is even suggested according to the teachings of the Sato reference. The Examiner's comments with respect to the assertion that it is inherent in the Sato cell generator that a delay between each data stream occurs is therefore of little or no consequence, given that the delays according to the present invention are applied to replicated data streams and are predetermined in nature, as now reflected in Claims 22 and 44 as amended. Where not explicitly specified as being a predetermined delay, Claims 22-46 as amended reflect this aspect of the present invention by referring to the delay which results from the architecture of the buffer memory which is used to

- 11 -

store the replicated data streams. For instance, Claim 24 recites that the delay provided to each digital data stream correlates to the length of the logical buffer associated with the replicated data stream. The same reasoning holds true for the recitation of the scheduling means in each of Claims 33 and 45 as amended.

In addition to the differences between the device according to the Sato reference and the present invention as exemplified by the replication of an input traffic pattern or data stream and the introduction of predetermined delays to each such stream, the functioning of said Sato device is markedly different from that of the present invention. According to the present invention, when a memory buffer corresponding to a given data stream is full, data blocks associated with that logical buffer are forwarded to its corresponding output port. In contrast, when the input buffer 3 according to the Sato reference is congested, the input buffer 3 is commanded to release the resources which are used by the test cells accumulated in the buffer such that those resources can be used only by normal traffic cells. In other words, the notional skilled person would understand that such test cells are discarded as opposed to being forwarded for output purposes (Column 5, lines 38 to 45). As was the case with the device as taught by the Uriu reference, the device according to Sato is not substitutable nor analogous with the device of the present invention. In fact, it would be expected that a device according to the present invention would be inserted at or before the input buffer server 2 according to Sato so that the test cell generating unit 1 of Sato would act to provide an input data stream to the device of the present invention. A person skilled in this art would therefore not likely have any motivation to use the teachings of the Sato reference in order to arrive at the present invention.

For the foregoing reasons, the Examiner is respectfully invited to withdraw her rejections of Claims 22-46 in view of the Sato reference.

- 12 -

The Examiner is advised that Claim 24 was amended to correct a minor error of syntax and that Claims 38, 41 and 42 were cancelled so as to avoid duplication of claims. Claims 22 and 33 were additionally amended to remove the respective phrases "to mimic real digital traffic input conditions for the communication device" and "for mimicking real data traffic input patterns for". This was previously explained above with reference to similar amendments made to Claims 1, 13, 18, 20 and 22. Claim 33 was amended to add the phrase "at least", which previously was found in cancelled Claim 38.

By way of the present amendment, this application is believed to be in condition for allowance and such action in due course is earnestly solicited.

* * *

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached pages are captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE."

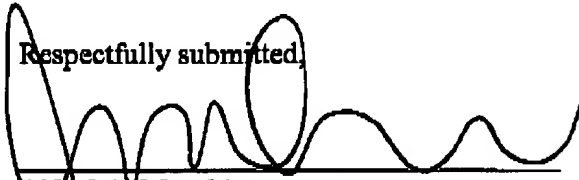
No new matter has been added by way of this amendment. All claim amendments have been made to clarify antecedents, correct typographical errors or improve syntax, except to more clearly associate the ambit of the claims with a testing method and a testing system for a communication device as specifically noted herein.

- 13 -

By way of the present amendment, this application is believed to be in condition for allowance and such action in due course is earnestly solicited. The Examiner is invited to contact the undersigned by telephone to discuss this case further, if necessary.

24 March 2003
Date

Respectfully submitted,



Alfred A. Macchione
(Registration No. 40,333)
Blake, Cassels & Graydon LLP
P.O. Box 25, Commerce Court West
Toronto, Ontario M5L 1A9
CANADA
Telephone: (416) 863-2463
Facsimile: (416) 863-2653

- 14 -

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In re. Application of: McBRIDE, Brian E.
Serial No.: 09/261,197
Filed: March 3, 1999
Title: CELL STREAM REPLICATING DEVICE
Examiner: STEVENS, Roberta A.
Art Unit: 2665
Confirmation Number: 7444
Atty's Docket No.: 53921/00056

IN THE CLAIMS

Claim 1 has been amended as follows:

1. A method of generating digital traffic for use in testing a multi-port communication device, said method comprising the steps of:

generating a reference digital traffic pattern; and
generating a plurality of traffic streams replicated from the reference digital traffic pattern, wherein the plurality of traffic streams are used for loading respective input ports of the communication device ~~to mimic real digital traffic input conditions for the communication device; and~~
introducing a plurality of phase delays among the plurality of traffic streams when compared to the reference digital traffic pattern.

Claim 2 has been cancelled in its entirety.

- 15 -

Claim 3 has been amended as follows:

3. The method according to claim 21, wherein the communication device effects statistical multiplexing amongst the plurality of traffic streams.

Claim 6 has been amended as follows:

6. A method of loading a multi-port communication device with digital traffic, the method comprising the steps of:

generating a digital traffic pattern; and

providing a plurality of streams of replicated from the digital traffic pattern to input ports of the communication device, the plurality of streams having a plurality of phase delays therebetween.

Claim 8 has been amended as follows:

8. A method of loading a multi-port communication device with digital traffic, said method comprising the steps of:

generating from a digital traffic stream a plurality of digital traffic streams having identical data content thereto; and

providing the plurality of digital traffic streams with a plurality of phase delays therebetween to input ports of the communication device.

Claim 13 has been amended as follows:

13. Apparatus for generating digital traffic for use in testing a multi-port communication device, said apparatus comprising:

- 16 -

a reference pattern generator generating a reference pattern defining a digital traffic pattern; ~~and~~

a traffic stream replicating device generating a plurality of traffic streams replicated from the reference pattern; ~~;~~

means for introducing respective phase delays among the plurality of traffic streams; and
wherein the plurality of traffic streams load respective input ports of the communication device ~~to mimic real digital traffic input conditions for the communication device.~~

Claim 14 has been cancelled in its entirety.

Claim 15 has been amended as follows:

15. The apparatus according to claim 14 13, wherein the communication device effects statistical multiplexing of the plurality of traffic streams.

Claim 18 has been amended as follows:

18. An apparatus for loading a multi-port communication device with digital traffic, the apparatus comprising:

a traffic generator generating input digital traffic; and

means for providing a plurality of streams ~~of~~ replicated from the input digital traffic to
input

ports of the communication device, the plurality of streams provided with phase delays
~~therebetween to mimic real digital traffic input conditions for the communication device.~~

- 17 -

Claim 20 has been amended as follows:

20. Apparatus for loading a multi-port communication device with digital traffic, the apparatus comprising:

means for generating from a digital traffic stream a plurality of digital traffic streams having identical data content thereto; and

means for providing the plurality of digital traffic streams to input ports of the communication device with a phase delay introduced to at least one of the plurality of digital traffic streams ~~to mimic real digital traffic input conditions for the communication device.~~

Claim 22 has been amended as follows:

22. A digital data stream replicating device, comprising:

an input port for receiving an input continuous digital data stream comprising input data blocks at an input transmission rate;

broadcast means for replicating the input continuous digital data stream into N streams of replicated continuous digital data streams;

N output ports for transmitting the plurality of replicated continuous digital data streams at output transmission rates, each output transmission rate at least equal to the input transmission rate; and

delay means for introducing a predetermined delay for each replicated continuous digital data stream of the plurality of replicated digital data streams with respect to the input continuous digital data stream ~~to mimic real digital traffic input conditions for the communication device.~~

- 18 -

Claim 24 has been amended as follows:

24. The device according to claim 22, wherein the delay means comprises:

a memory having N first-in first-out (FIFO) logical buffers established therein, each logical buffer being associated with one digital data stream of the plurality of replicated continuous digital data streams,

wherein when a logical buffer of the N FIFO logical buffers is full, data blocks associated with the logical buffer are forwarded to an output port of the N output ports associated with the logical buffer, such that a delay provided to a digital data stream transmitted through the output port correlates to a length of the logical buffer.

Claim 33 has been amended follows:

33. A digital data stream replicating device ~~for mimicking real data traffic input patterns for~~ for providing data traffic input patterns to a communication device, comprising:

an input port for receiving a continuous digital data stream comprising input data blocks at an input transmission rate;

a memory;

N output ports, each having an output transmission rate at least equal to the input transmission rate;

processing means, connected between the input port and the N output ports, for establishing N first-in first-out logical buffers in the memory and associating each of the input data blocks of the continuous digital data stream with each one of the N logical buffers so as to replicate the input data blocks thereacross, each logical buffer being associated with only one of the output ports; and

- 19 -

scheduling means for forwarding data blocks associated with a given logical buffer through its corresponding output port when the given logical buffer is full.

Claim 38 has been cancelled in its entirety.

Claim 39 has been amended as follows:

39. The device according to claim ~~38~~33, the device further including means for introducing empty data blocks into an output digital data stream replicated by the logical buffer for its corresponding output port when the output transmission rate of its corresponding output port is greater than the input transmission rate.

Claims Claims 41 and 42 have each been cancelled in their entirety.

Please amend Claim 44 as follows:

44. A performance testing device, comprising:
a traffic generator for generating a continuous digital data stream;
an input port for receiving the continuous digital data stream at an input transmission rate;
broadcast means for replicating the input digital data stream N times;
N output ports for transmitting each such replicated digital data stream through a separate output port at an output transmission rate at least equal to the input transmission rate; and
delay means for introducing a predetermined relative delay for each said transmitted digital data stream with respect to the input digital data stream.

- 20 -

Please amend Claim 45 as follows:

45. A performance testing device, comprising:

a traffic generator for generating a continuous digital data stream;

an input port for receiving the continuous digital data stream comprising input data blocks at an input transmission rate;

a memory;

N output ports, each having an output transmission rate at least equal to the input transmission rate;

processing means, connected between the input port and the N output ports, for establishing N first-in first-out logical buffers in the memory and associating each of the input data blocks of the continuous digital data stream with each one of the N logical buffers so as to replicate the input data blocks thereacross, each logical buffer being associated with only one of the output ports; and

scheduling means for forwarding data blocks associated with a given logical buffer through its corresponding output port when the given logical buffer is full.